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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/926,780	12/18/2001	Rudolf Ritter	217127US2PCT	1470

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ALEXANDRIA, VA 22314

EXAMINER

STILES, WESLEY L

ART UNIT	PAPER NUMBER
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2616

DATE MAILED: 08/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/926,780

Applicant(s)

RITTER ET AL.

Examiner

Wesley Stiles

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 December 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4,6-10 and 12-15 is/are rejected.
- 7) ☒ Claim(s) 5,11,16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 December 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____

DETAILED ACTION***Drawings***

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 52 of Figure 1. Corrected drawing sheets, or amendment to the specification to add the reference character(s) in the description, are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

2. As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC (See 37 CFR 1.52(e)(5) and MPEP 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text are permitted to be submitted on compact discs.) or
REFERENCE TO A "MICROFICHE APPENDIX" (See MPEP § 608.05(a). "Microfiche Appendices" were accepted by the Office until March 1, 2001.)
- (e) BACKGROUND OF THE INVENTION.
 - (1) Field of the Invention.
 - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (f) BRIEF SUMMARY OF THE INVENTION.
- (g) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (h) DETAILED DESCRIPTION OF THE INVENTION.
- (i) CLAIM OR CLAIMS (commencing on a separate sheet).
- (j) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (k) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 1, 3, 7, 9, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ruoff, Jr. (US 4,513,317) in view of Trumbull (US 6,454,411) and further in view of Deering (US 6,717,578) and Butler (US 5,528,677). Regarding claim 1, Ruoff teaches a system for transmitting and presenting video data. The system of Ruoff contains a display device to present the received video data to the user (column 2, lines 58-59) and includes an eye tracking device to determine current eye positions of the user (met by "eye tracker 100" as disclosed in column 3, lines 7-8) as well as an eye position feedback module which receives the eye position data from the eye tracker and is coupled to the video center, labeled "camera control" (see column 3, lines 7-12 and lines 26-32). In addition, the system of Ruoff also discloses a differential resolution system in which the part of the image in the users line of sight is transmitted in high resolution, while the rest of the image is transmitted in a lower resolution to reduce the required bandwidth (see column 3, lines 20-32). Ruoff meets all limitations of claim 1 except for the use of a "virtual retinal display", the storage of the video information in a digital database, the filtering of that stored video information, and the explicit presence of a telecommunications network.

5. In analogous art, Trumbull teaches a virtual retinal display system which projects pictures signals corresponding to the received video data onto the retina of the user (see column 2, lines 13-19). Trumbull also discloses a database which stores the video data (see column 5, lines 21-26). The contents of this database can be accessed based on the results of the eye-tracking component of the system (see column 8, lines 15-46).

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6. Also in analogous art, Deering discloses a variable resolution display system in which the system can detect the point of foveation of the user's eyes and provide that area of the display with a higher "sample density", which is congruous to resolution (see column 4, line 64 to column 5, line 7). Deering accomplishes this through the use of a filter module that cuts out samples from the outer areas of the graphic, leaving the inner region data unaltered, thus achieving the multi-resolution output. The filtering takes place in thought the use of a sample buffer, wherein the graphics information is generated, stored in the buffer, then filtered based on data received from the eye tracker. The filter, possibly circularly symmetrical as shown in column 5, lines 62-65, follows the eye movement of the user to provide the point of foveation with the highest sample density and removes unneeded data from the outlying areas. See column 4, lines 1-15 and lines 46-58 for details of Deering's filtering mechanism.

7. In further analogous art, Butler (see column 1, lines 18-23) teaches the use of a telecommunications network to transmit data as known prior art. It would have been obvious to modify Ruoff to include the claimed telecommunications network to provide data transfer over a widely established and accessible network.

8. At the time of the invention, it would have been obvious to one of ordinary skill in the art to use the database and display system of Trumbull to store and display video data through the differential resolution system of Ruoff, and to apply the buffer and filtering function of Deering to that system. The motivation for combining Trumbull with Ruoff would have been to incorporate commonly used digital video data into the system of Ruoff, and the motivation for adding Deering to that combination would have been to allow the system to transmit one digital data stream to accomplish the differential resolution, as opposed to two (high and low density) overlapping signals. Applying the filter of Deering would allow the system to send a lone data stream comprising both the high and low resolution areas of the graphic. As stated by Trumbull, "there is considerable interest in entertainment and/or educational systems that provide a more realistic experience to the user and that do not require the substantial hardware and software typically employed by a full-field video projection system." Incorporating the systems of Trumbull and Deering to Ruoff's implementation

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would help achieve this minimal hardware goal. In addition, using a telecommunications network as disclosed in Butler is a commonly used channel to transmit data. Thus, it would have been obvious to update the system of Ruoff to incorporate the use of digital data and a smaller, more mobile "virtual retinal display" which displays filtered video data that responds to user eye movements over a telecommunications network.

9. Regarding claim 3, the combination of Ruoff, Trumbull, Deering, and Butler teaches all of the claimed limitations as discussed for claim 1 above.

10. Regarding claim 7, the combination of Ruoff, Trumbull, Deering, and Butler teaches all of the claimed limitations as discussed above.

11. Regarding claim 9, the combination of Ruoff, Trumbull, Deering, and Butler teaches all of the limitations stated in the claim as discussed for claim 1 above.

12. Regarding claim 13, the combination of Ruoff, Trumbull, Deering, and Butler teaches all of the claimed limitations as discussed for claim 1 above.

13. Regarding claim 14, the combination of Ruoff, Trumbull, Deering, and Butler teaches all of the limitations stated in the claim as discussed for claim 1 above.

14. Claims 2 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ruoff, Trumbull, Deering, and Butler and further in view of Ritter (US 6,657,538). Regarding claim 2, the combination of Ruoff, Trumbull, Deering, and Butler teaches all of the limitations except the presence of a mobile network and mobile radio device.

15. In analogous art, Ritter teaches the use of a telecommunications network, wherein the network comprises a mobile network (see column 3, lines 57-64) and the communications terminal is a mobile radio device (see column 4, lines 18-19).

16. At the time of the invention, it would have been obvious to one of ordinary skill in the art to apply the system taught by the combination of Ruoff, Trumbull, Deering, and Butler to the mobile network disclosed by Ritter. The motivation for doing so would be to allow the video data to be broadcast for the use of video conferencing, as the use of a mobile network would drastically increase the allowable range between the video center and the user. Therefore, it would have been

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obvious to combine the system of Ruoff, Trumbull, Deering, and Butler with the mobile network shown by Ritter to enable video conferencing, and to drastically increase the range between the video center and the user.

17. Regarding claim 8, the combination of Ruoff, Trumbull, Deering, Butler, and Ritter teach all claimed limitations as discussed for claim 2 above.

18. Claims 4, 5, 10, 11, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ruoff, Trumbull, Deering, and Butler and further in view of Smyth (US 5,726,916). Regarding claim 4, the combination of Ruoff, Trumbull, Deering, and Butler teaches all of the limitations of the claim except for the ability to predict future eye positions.

19. In analogous art, Smyth teaches the use of an eye tracking system that can predict eye movement. In the system of Smyth, the device detects saccades and fixation and predicts end points. This is done by receiving position data, calculating movement velocity, and estimating when and where the eye will be positioned at the end of the movement. See column 13, lines 1 to column 14, line 4 for a description of the prediction system. The ability to calculate velocity based on eye positions means that there is inherent position storage in the system.

20. At the time of the invention, it would have been obvious to one of ordinary skill in the art to use the movement prediction scheme of Smyth in conjunction with the system as taught by the combination of Ruoff, Trumbull, Deering, and Butler. The motivation for doing so would have been to allow the control system to prepare the appropriate next scene, in regards to which areas of the image should have a higher resolution, prior to the user's eye movement requesting it to do so. This would help reduce lag time between the video center and the display. Therefore, it would have been obvious to combine the movement prediction ability taught by Smyth with the system disclosed by the combination of Ruoff, Trumbull, Deering, and Butler to achieve a video transmission and display system that responds to eye movements of the user and can predict future eye movements.

21. Regarding claim 5, the combination of Ruoff, Trumbull, Deering, Butler, and Smyth teaches all claimed limitations wherein Smyth discloses an eye movement prediction routine that can separate unintentional saccades from tracking of moving targets on the video screen, which inherently requires

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video data, mainly the presence of moving targets, to be taken into consideration by the prediction module. See column 13, lines 1-3.

22. Regarding claim 10, the combination of Ruoff, Trumbull, Deering, Butler, and Smyth teaches all claimed limitations as discussed for claim 4 above.

23. Regarding claim 11, the combination of Ruoff, Trumbull, Deering, Butler, and Smyth teaches all claimed limitations as discussed for claim 5 above.

24. Regarding claim 15, the combination of Ruoff, Trumbull, Deering, Butler, and Smyth teaches all claimed limitations as discussed for claim 4 above.

25. Regarding claim 16, the combination of Ruoff, Trumbull, Deering, Butler, and Smyth teaches all claimed limitations as discussed for claim 5 above.

26. Claims 6 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ruoff, Trumbull, Deering, and Butler and further in view of Chen (US Patent 5,852,489). Regarding claim 6, the combination of Ruoff, Trumbull, Deering, and Butler teaches all of the limitations of the claim except for the ability of the user to correct eye position values.

27. In analogous art, Chen discloses a display system with an eye-tracking device. He teaches a calibration routine wherein correction values are received from the user by centering a cross hair in a disc on the display screen and pressing an input button. The routine calculates correction coefficients, stores them to memory, and uses them to correct the eye position for each subsequent displayed image. See column 8, lines 23-31 of Chen.

28. At the time of the invention, it would have been obvious to one of ordinary skill in the art to combine the system of Ruoff, Trumbull, Deering, and Butler with the calibration module of Chen. The suggestion for doing so would have been to electronically allow the user to account for outside variables that may affect the display. This allows each individual user to adapt the viewing system for their own characteristics and ensures that each user would only have to make the corrections once, as electronic calibrations are not as easily upset as mechanical calibrations. Therefore, it would have been obvious to combine the system of Ruoff, Trumbull, Deering, and Butler with the calibration

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module of Chen to create a video data transmission and virtual retinal display system wherein the user could electronically and individually make calibration alterations.

29. Regarding claim 12, the combination of Ruoff, Trumbull, Deering, Butler, and Chen teaches all limitations as discussed for claim 6 above.

Allowable Subject Matter

30. Claims 5, 11, and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

31. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. Daly et al. US Patent 6,173,069 discloses a system of video coding wherein the quality of a portion of the image is based on its significance.
- b. Furness, III et al. US Patent 5,467,104 discloses a virtual retinal display system.
- c. Maguire, Jr. US Patent 5,422,653 discloses a virtual reality display system with non-uniform resolution.
- d. Richards US Patent 6,163,336 discloses a head/eye tracking system for stereoscopic displays.
- e. Richardson et al. US Patent 6,373,961 discloses a screen pointer controlled by user eye movement.
- f. Weiman et al. US Patent 5,103,306 discloses a method of digital image compression with variable resolution.


32. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wesley Stiles whose telephone number is (703) 308-6107. The examiner can normally be reached on 7:00-4:30, out of the office on alternating Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Faile can be reached on (703) 305-4380. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

WLS
7/26/04



VIVEK SRIVASTAVA
PRIMARY EXAMINER